conclusion previously arrived at by Merunowicz, that the higher percentage of blood in the irrigating fluid increases the irritability of the muscle, while a lower proportion favors the muscular discharges.

THE FUNCTIONS OF THE CEREBRAL CORTEX.—We translate the following abstract by Sigmund Exner of J. Munk's recent memoir on the functions of the brain, from the *Biologische Centralblatt*, No. 1, April 15, of this year.

The book before us contains six lectures delivered from 1877 to 1880 before the Physiological Society and one before the Academy of Sciences, of Berlin. The earliest publication is a historical introduction, together with a series of critical remarks, with also important suggestions for the experimenter. It may be well to use this opportunity to give a comprehensive abstract of the author's experimental results, although they do not altogether belong to the most recent times.

In opposition to the view of Gall, chiefly by reason of the experiments of Flourens and Longet, the idea of the unity of the cortex of the brain as the organ of the mental functions had become established with physiologists. Nevertheless, clinical observation had afforded the proof that certain mental activities were associated with the integrity of limited localities of the brain (speech centre), and anatomical investigations had rendered it probable that sensory and motor functions were associated with different portions of the cerebrum. Fritsch and Hitzig showed in 1870 that electric excitation of limited tracts of the cortex produced movements in definite muscular groups on the opposite side of the body, and that definite muscle groups belonged functionally to definite regions of the cortex. For the purpose of demonstrating localized centres for the separate sensory functions, Munk has the especial credit of having made numerous and careful investigations in dogs and monkeys.

In the dog the larger portion of the occipital lobe has the function of a "visual sphere"; that is, in it occur the central changes on which the function of sight depends. It is the ultimate distinction of the optic fibres, according to the following arrangement. The greater part of the left retina is in connection with the right visual sphere; only the most lateral portion, not over a quarter of the whole retina, measured horizontally, is in connection with the visual sphere of the same side. That of the right eye is correspondingly connected with the left side of the brain. The distribution of the fibres is so arranged that the retinal and the cortical terminations in the opposite hemisphere are inverted, so that what is on the right in the retina is on the left in the cortex, and what is above in the former is below in the latter. Extirpation of any one portion of the cortical visual tract renders the corresponding part of the retina insensible ; extirpation of one "visual sphere" blinds the eye on the opposite side, except its outermost part ; extirpation of both cortical visual tracts causes complete and permanent blindness. In each visual tract is a central portion, characterized by the peculiarity that its extirpation produces a loss of visual memory in the opposite eye ; that is, the dog still sees, but does not recognize its food, etc., any more. This visual appreciation may later become restored. The author distinguishes between this kind of visual loss and ordinary loss of sight from injury to the cortex, and calls the former psychic blindness (*Seelenblindheit*) and the latter cortical blindness (*Rindenblindheit*). This spot, destruction of which causes psychic blindness, contains also the central terminations for those parts of the retina for the fixation of vision—corresponding to the fovea centralis in men. In the temporal lobe is situated the auditory cortical tract. This also contains a special spot, extirpation of which causes psychic deafness ; that is, the dog still hears, he pricks up his ears at a sound, but he no longer comprehends what it means.

The touch sense has also its region in the cortex, and indeed this "sensory sphere" involves nearly the whole of the convexity that is not occupied by the visual and auditory tracts. In this can be still further distinguished the subdivisions corresponding to different parts of the body, especially those for the anterior and posterior limbs, the head, an eye, ear, neck, and back regions. All these lie in the anterior half of the cortex, and show an arrangement that makes a relation between the results of our author and those of Hitzig appear certain.

In his experiments on monkeys Munk obtained results corresponding to those obtained in experimenting with dogs.

MECHANICAL EXCITATION OF THE NERVES.—K. Hallsten, *Nordiskt Med. Arkiv*, Trettonde Baudet, Första Häftet, 1881, No. 6, describes some physiological investigations on the excitation of nerves by the use of a new method. He so arranged a Marey's tambour that the lever should strike against the nerve